


Metrics and Benefits Guidance for the ARRA Smart Grid Programs

*Guidance for ARRA Smart Grid Program Metrics and Benefits: CO² Emissions and
Pollutant Emissions*

July 23, 2010

Guidance for ARRA Smart Grid Program Metrics and Benefits		
Metric	CO ₂ Emissions and Pollutant Emissions	
Smart Grid Category	All	
Metric Type	Impact	
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Revision and Date	N/A	

Background

If a Smart Grid Program intends to avoid vehicle miles, decrease the amount of central generation needed to serve load, and or reduce peak generation, then the project team should report CO₂ Emissions and Pollutant Emissions (i.e., NO_x, SO_x, and PM-2.5) metrics. The DOE has avoided being prescriptive about how to calculate these metrics purposely because the DOE wants to avoid advocating one calculation method over another. Furthermore, the DOE wants to be clear that project teams can use calculation methodologies that they have expertise in or may be currently employing. This document offers general guidance and clarification around these metrics including what types of factors will impact these emission metrics and cases when certain pollutants can be excluded from reporting. In the event that a project team cannot determine an adequate calculation methodology for one or more of the emissions, the Metrics and Benefits Team should be contacted for further guidance.

Guidance

There are three distinct areas for which emission metrics could be reported on: AMI & Customer Systems, Distribution, and Transmission programs. The emissions metrics for these three areas should be reported separately since the causes of the emissions reduction in each case are unique. Below is a summary of the potential sources of emissions reduction for each area.

- CO₂ and Pollutant Emissions (AMI & Customer Systems) – Emission reduction from an AMI project could result from three main sources: reduced vehicle miles, reduced electricity consumption, and reduced peak generation. Reduced vehicle miles could be the result of avoided meter reads, meter connection/disconnections, outage validation, etc. Reduced electricity consumption can result from giving customers access to real-time usage data, dynamic pricing options, or other efficiency programs. Reduced peak demand can lead to a marginal emissions reduction and could result from Demand Response programs and pricing programs.
- CO₂ and Pollutant Emissions (Distribution) – Emission reduction from a Distribution project could result from two main sources: reduced vehicle miles and reduced electricity losses. Reduced vehicle miles could be the result of avoided switching operations, avoided maintenance truck rolls, and reduced restoration truck rolls. Reduced electricity losses could result from implementing Conservation Voltage Reduction or more efficient operation of the distribution grid.

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- **CO₂ and Pollutant Emissions (Transmissions)** – Emission reduction from a Transmission project could result from three main sources: reduced vehicle miles, reduced electricity losses, and more optimal generation dispatch. The reduced vehicles miles can come from similar sources as those on the distribution grid. Reduced electricity losses could result from a more efficient operation of the transmission grid. Increased wide area visualization and control can lead to more efficient dispatch of generation and the integration of more renewable sources of power.

It should be noted that the “Guidebook for ARRA Smart Grid Program Metrics and Benefits” and the Discussion of Data for Smart Grid Metrics and Benefits slide decks listed PM-10 as a pollutant emission. However, DOE requests Smart Grid Programs to report PM-2.5 instead of PM-10.

Depending on the source of the emissions reduction, certain pollutants can be excluded from reporting. The table below summarizes which pollutants should be included and which can be excluded depending on the source of the emissions.

Table 1. Summary of Pollutants Required for Reporting by Source

Pollutants Required for Reporting by Source				
<u>Source</u>	<u>CO₂</u>	<u>SO_x</u>	<u>NO_x</u>	<u>PM-2.5</u>
Vehicles	Required	Required	Required	Not Required
Electricity Generation	Required	Required	Required	Required